UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,777	07/09/2007	Richard H. Abram	KC-0189	4749

34610 7590 07/09/2008

KED & ASSOCIATES, LLP
P.O. Box 221200
Chantilly, VA 20153-1200

EXAMINER	
FORDE, DELMA ROSA	
ART UNIT	PAPER NUMBER
2828	

MAIL DATE	DELIVERY MODE
07/09/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/593,777	ABRAM ET AL.	
	Examiner	Art Unit	
	Delma R. Fordé	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 – 4, 6, and 10 – 15 and 18 – 19* is/are rejected.

7)☒ Claim(s) *5, 7 – 9 and 16 – 17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 December 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/20/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

The priority has been considered by the examiner.

Information Disclosure Statement

The references cited in the Information Disclosure Statement (IDS) have been considered by the examiner.

Drawings

The drawings submitted on 07/09/2007 have been considered by the examiner.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 12, 13 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Jin (2002/0054614).

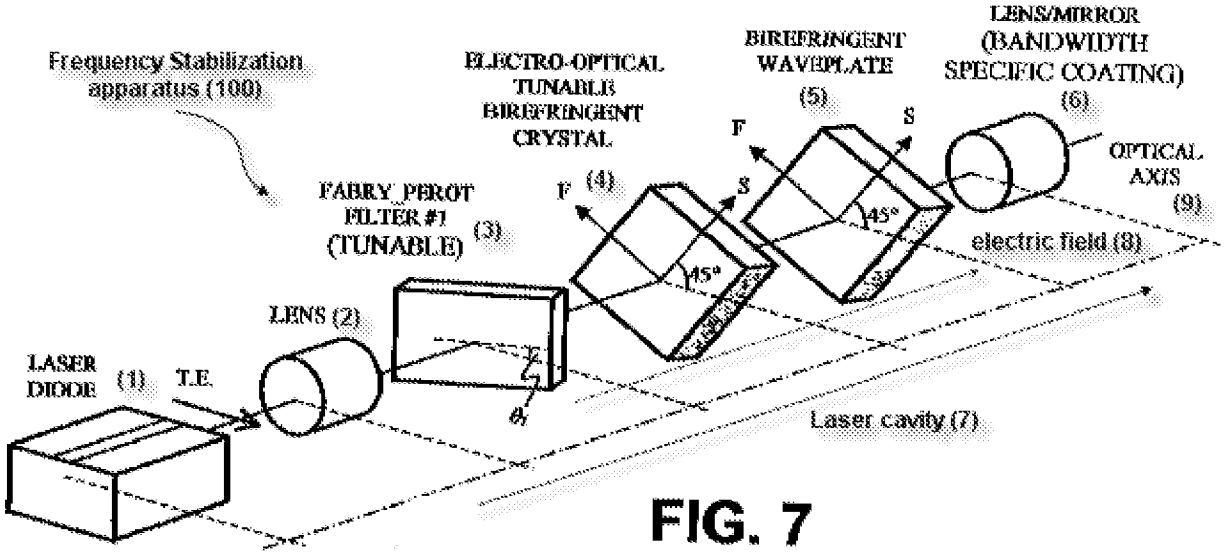

FIG. 7

The examiner modified the drawing to be clearer in the rejection.

Regarding claim 1, Jin discloses a frequency stabilization apparatus for stabilizing a frequency, the frequency stabilization apparatus (see Figure. 7, Character 100) comprising an intracavity birefringent etalon (see Figure. 7, Character 3, the reference call "Fabry-Perot Etalon Filter"), wherein the intracavity birefringent etalon (see Figure. 3, Character 3) is employed to derive a polarized electric field (see Figure. 7, Character 8, Paragraphs [0043], "the electro-optical material with electric field dependent refractive index change characteristics to vary etalon cavity optical length") component from an intracavity electric field of the laser cavity (see Figure. 7, Character 7), the orientation of polarization of the polarized electric field component being dependent on the frequency and polarization of the intracavity electric field (abstract, Paragraphs [0003,0017 and 0035], "the electro-mechanical bending actuator changing the angle of etalon relative to the laser light propagation") .

Regarding claim 2, Jin discloses a birefringent etalon acts as a waveplate (see Figure. 7, Character 5, Paragraphs [0043]).

Regarding claim 12, Jin discloses a method for stabilizing a frequency (see Figure. 7, Character 100) output of a laser cavity comprising the steps of: employing a birefringent etalon (see Figure. 7, Character 3, the reference call "Fabry-Perot Etalon Filter") to sample an intracavity electric field (see Figure. 7, Character 8) of the laser cavity (see Figure. 7, Character 7) so as to derive a polarized electric field (see Figure. 7, Character 8) component whose polarization is dependent on the polarization and frequency of the intracavity electric field relative to a resonant frequency of the birefringent etalon (see Figure. 7, Character 3) ; deriving an error signal from the polarized field component and stabilizing the birefringent etalon to the derived error signal, (abstract, Paragraphs [0010, 0011 and 0015]) .

Regarding claim 13, Jin discloses a polarized electric field (see Figure. 7, Character 8) component is linearly polarized when the intracavity electric field corresponds to a resonant frequency of the birefringent etalon (Paragraphs [0007]).

Regarding claim 18, Jin discloses an etalon is stabilized to the derived error signal by controlling the orientation of the birefringent etalon within the intracavity

electric field in order to minimize the magnitude of the error signal (abstract, Paragraphs [0003, 0017 and 0035]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3, 4, 6, 14 and 15 are rejected under 35 U.S.C. 103 (a) as being unpatentable over in Jin (2002/0054614) in views of Sharp et al (5,381,253)

Regarding claim 3, Jin discloses the claimed invention except second quarter waveplate. Sharp teach a second quarter waveplate. However, it is well known in the art to apply second quarter waveplate as discloses by Sharp in Column 10, Lines 57 – 68. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was to apply the well known second quarter waveplate as suggested by Sharp to the laser of Jin, because provided in order to transform linearly polarized (see Sharp in Column 10, Lines 57 – 68), since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. St. Regis Paper Co. v. Bemis Co., 193 USPQ 8.

Regarding claims 4, 14 and 15, Sharp discloses an elliptical polarization analyzer for analyzing the state of polarization of the polarized electric field component on being transmitted through the second quarter waveplate (Abstract, Column 6, lines 37 - 68 and Column 7, Lines 1 - 21).

Regarding claim 6, Jin discloses optical axis of the second waveplate (see Figure. 7, Character 5, the reference call "Birefringent waveplate") is aligned at 45^0 relative to an optical axis (see Figure. 7, Character 9) of the birefringent etalon (see Figure. 7, Character 3, the reference call "Fabry-Perot Etalon Filter") such that on being transmitted through the second quarter waveplate the polarized electric field component of an off resonance frequency is linearly polarized, the plane of linear polarization being dependent on the frequency of the intracavity electric field relative to the resonant frequency of the birefringent etalon ((Paragraphs [0043))

Claims 10, 11 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jin (2002/0054614) in views of Cotteverte et al (et al. (2002/0071463 A).

Regarding claims 10 and 19, Jin discloses the claimed invention except for scanning. Cotteverte e teaches a scanning. However, it is well known in the art to apply scanning as discloses by Cotteverte in Paragraphs [0116, 0131 and 140]. Therefore, it

would have been obvious to a person having ordinary skill in the art at the time the invention was to apply the well known scanning as suggested by Cotteverte to the laser of Jin, because to scanning the optical length of the laser cavity with respect to the resonance frequency of the etalon (see Paragraph 0116 of Cotteverte).

Regarding claim 11, Cotteverte discloses the cavity length adjuster comprises at least one laser cavity mirror mounted on a piezoelectric crystal (Paragraphs [0109]).

Allowable Subject Matter

Claims 5, 7 – 9 and 16 – 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 5, 7 – 9 recites a frequency stabilization apparatus including *the elliptical polarization analyzer comprises a polarization dependent beam splitter and two light detecting means wherein the polarization dependent beam splitter is orientated so as to resolve the polarized electric field component into two spatially separated components each of which is incident on one of the light detecting means,* which is neither anticipated or disclosed nor suggested in any piece of available prior art, which is neither anticipated nor obvious over the prior art of record.

Claims 16 – 17 recites a method for stabilizing a frequency output of a laser cavity including *a Π/2 phase shift to the orthogonal constituent components of the polarized electric field component; resolving the orthogonal constituent components of*

the polarized electric field component; and calculating an intensity ratio signal the orthogonal constituent components of the polarized electric field component, which is neither anticipated or disclosed nor suggested in any piece of available prior art, which is neither anticipated nor obvious over the prior art of record.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delma R. Fordé whose telephone number is (571) 272-1940. The examiner can normally be reached on M - F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Min Sun Harvey can be reached on (571) -272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Delma R. Fordé/
Examiner, Art Unit 2828

/Minsun Harvey/
Supervisory Patent Examiner, Art Unit 2828